

## Packaging for pulverulent material

The present invention relates to a package for pulverulent material according to the preamble of claim 1.

5 Stringent requirements with regard to hygiene and dosage are imposed on packaging for baby food. Therefore, such a powder is currently stored in cylindrical metal cans that are sealed by a metal lid or plastic lid that has to be opened before use and that is reclosable in a simple manner. Scoops that are so designed that an accurate volume for pulverulent material is delimited therein are used for dosage. By levelling off, a predetermined amount  
10 can be accommodated in the volume of the scoop cavity. It is important that this amount is accurately specified in order, on the one hand, to guarantee that the baby receives sufficient food and, on the other hand, as far as possible to prevent problems with constipation in the children. It must be understood that pulverulent material must be understood to be any granular material, in particular spray-dried food products, as well as agglomerates of the  
15 powder particles.

In such a packaging, such a scoop is generally loose between the top of the contents and the bottom of the lid on the product.

After the scoop has been used, some users replace the scoop in or on the product. Other users consider it to be unhygienic to put the scoop back into the contents of the  
20 container after use. Therefore, the scoop is frequently stored outside the container, which in practice further increases the risk of contamination. On the other hand, the size and the height of such containers are so designed that as compact as possible a volume is obtained in order to obtain optimum filling of the shelf at the point of sale.

US 6 604 645 B1 discloses a container having a lid to which a scoop is moulded and  
25 connected thereto by a film hinge. The top of the container is provided with a seal enclosed by the assembly of the lid and scoop. At first use the scoop is separated from the lid. Sealing of the container at the location where the lid should connect to the wall of the container is very complicated. Stack ability of the lid prior to assembly with the container is limited due to the shape thereof.

30 FR 2 747 107 discloses a container which is sealed off and having on top thereof a ring comprising a scoop as well as a lid. After removal of the scoop from the ring and tearing off the seal, the ring can be positioned on the container after which the lid can become effective.

In both US 6 604 645 and FR 2 747 107 the user has to break away the scoop from a further plastic part involving the risk of particles getting into the food material which might be highly dangerous.

The invention aims to provide a container, lid, scoop assembly wherein the scoop is not permanently connected with the lid so that breakage is not longer necessary. Furthermore, the lid to be used with the container should be easily stackable with other lids during production thereof. The contents of the container should be guaranteed by the provision of a seal on top of the contents. The use of scoops having a different volume should be possible without substantive changes to the lid.

According to the invention this is realized with the characterizing features of claim 1.

Stacking of the lids is provided by keeping the height of the lid relatively low. On the other hand there is an indication on the lid that a scoop is provided inside the container. Such an indication is an elevation of the lid having (part of) the shape of the scoop. The scoop is not connected to any of the lid and container, after filling the container with the intended contents. This means that breaking away of the scoop from another part of the package is not necessary after it has been filled.

According to the invention part of the volume of the scoop is accommodated by the top part of the container. To that end the seal is provided somewhat below the top edge of the container. This distance between the seal and the top edge of the container is preferably between 20 and 50 mm, and more in particular about 30 mm.

According to the present invention the user is encouraged to place the scoop in a accommodation made in the lid after using the scoop for the first time. This accommodation is partially delimited by the elevation described above. In particular, the open end of the bowl-shaped part of the scoop can be accommodated in this elevation. As a result the volume of the container does not increase to a significant extent, but, on the other hand, it can be ensured that the scoop can be stored in the container under the most hygienic conditions out of contact with the filling in the container.

More particularly, the elevation described above has a height of 2 - 25, in particular 4 - 15 mm, measured between the maximum of the height and the base of the elevation.

The lid according to the present invention preferably consists of a plastic material, that is hingedly connected to a lid rim, which likewise consists of plastic and is clamped on the container wall or fixed thereto in some other way. Preferably, the lid rim is provided with a levelling off edge, that is to say an angled portion or strip to avoid accumulation of

powder in the corner under which the top edge of the scoop can be scraped in a simple way in order to provide accurate reproducible and convenient dosage of the volume of product in the scoop.

5 In the case of conventional packaging it has proved to be a problem to remove the entire contents from the packaging. The reason for this is that manipulation within the relatively restricted space of the packaging is difficult. Moreover, it is not hygienic always to replace the scoop in the contents of the packaging after use, as is now customary.

10 In the case of known packaging, on hygienic grounds the scoop is first introduced into the container, after which the container is filled with the pulverulent material. Closure then takes place and on turning the packaging upside down the scoop will come to the top. This has the disadvantage that under adverse conditions pieces of plastic that break away or other particles from the production process can get into the powder, with all the associated consequences. Moreover, as a result of this procedure there is a relatively large empty space between the top of the product, such as powder, and the bottom of the lid (the so-called headspace). In the case of perishable substances, such a large head space filled with gas is disadvantageous. During the long storage time, certain substances contained in the product can be converted by the oxygen that is present in the gas.

A further aim of the present invention is to provide a packaging that does not have these disadvantages or has them to a lesser extent.

20 This further aim is realised with a packaging as described above in that the container wall contains a heat-sealable material on the inside and in that a plastic film seal extending over the free cross-sectional surface area of the container is arranged close to the top of the container, which seal is fixed to said container wall by heat sealing.

25 According to the present invention the space in which the scoop is accommodated is separated in an essentially gastight manner from the space in which the powder is present. Such a separation is possible by making the interior of the container wall of a heat-sealable material and, after introducing the powder, to produce a film cover on the powder with the heat-sealable material by heat sealing. A film providing a gastight seal is thus produced above the powder. The scoop can be placed on this film in some way or other.

30 The film is preferably a film that can be fixed to the peripheral wall by means of heat and that has odour-absorbing characteristics.

Optionally it is possible further to counteract perishing by, before or during application of the seal described above, removing the air or oxygen that is present in the

powder or container by applying a vacuum and introducing into the product a gas that counteracts perishing, such as nitrogen, carbon dioxide or any other inert gas or mixture of such gases under normal conditions.

Under normal conditions, the quality of the product will not deteriorate or will barely  
5 deteriorate after the packaging has been opened because the contents of the packaging will be used relatively rapidly after opening. The problem is the potentially long storage time, which can be achieved without any problem with the seal according to the invention. The packaging can be provided with a hinging lid, as a result of which the packaging can be effectively closed again after use.

10 However, it is also possible to arrange a snap-fit accommodation in the lid for snapping the scoop into this. This accommodation is preferably in or close to the centre of the lid and can enclose the bowl of the scoop and possibly the handle. Preferably during production the scoop is entered in the space between the lid and the seal without using the snap-fit accommodation. Only after first opening of the container the user will clamp the  
15 scoop to the snap-fit accommodation to prevent contact with the contents of the container.

According to a particularly advantageous embodiment of the invention, the packaging is made essentially rectangular. A rectangular construction has significant advantages with regard to packing and positioning on the shelf. Optimum use of volume can be achieved, it also being possible, when positioning on the shelf, easily to place the  
20 desired side facing the consumer in order to increase the power for stimulating an impulse to buy. A further advantage of an essentially rectangular packaging is that manipulation with the scoop is appreciably simplified. After all, for a given surface area, compared with a circle, the length of the diagonal of a rectangle is appreciably greater than the diameter of a circle. Preferably, the corners of the rectangle are rounded. There is preferably a  
25 levelling-off edge in the corner. This edge is preferably more than 9 mm wide measured from the corner and can comprise a triangle or a strip spaced from the corner. If a strip is used powder cannot accumulate in the adjacent corner. Such strip can have a width of 7-11 mm. The space from the nearest edge thereof to the corner is more than 4 mm and preferably about 5-9 mm.

30 It is possible to fit an accommodation for at least partially accommodating the scoop in the lid. The various aspects depend on the amount of product that has to be packed in the container, the desired cross-sectional surface area and the height of the container. As indicated above the free space (  $r$  ) between the seal described above and the bottom of the

lid is preferably between 14 and 27 mm. It has been found that in this way an optimum volume for the scoop is provided, whilst the packaging, when containing, for example, 900 g product, can be arranged stacked on a shelf in a simple manner.

Stringent requirements in respect of gas tightness and opacity are imposed on the packaging for certain products, such as baby food. Therefore, it is proposed according to the invention to make the wall of the container, like the bottom thereof, from a paper/metal foil/plastic laminate. The metal foil provides gas tightness and opacity. Paper or board functions as a support, whilst the plastic functions as heat-sealable material. The plastic used can be any material known in the state of the art.

According to a further advantageous embodiment, the seal, which is applied on the product, is provided with a tear lip and a weakening line. By pulling on the lip an opening can be obtained along the tear line, via which opening the contents can be removed from the packaging. On the one hand this provides easy access to the product, the user having to perform few special operations, and, on the other hand, tampering can easily be detected in this way. A further advantage is that any product particles that have come between the seal and the wall during heat sealing are not able to escape and remain enclosed.

After removing the film along the tear line, an edge of the film remains on the side walls. This edge will preferably be less than 5 mm, more preferably less than 4 mm, in order to allow the opening to the product to be as large as possible. The film consists of a material on which the user cannot injure him- or herself.

The container is preferably provided with means promoting gripping, such as finger recesses. As a result of the rectangular design of the container, one side of the packaging is optimum for each size of hand. One of the sides may have a maximum width of at most approximately 12.0 cm and is preferably 6 to 11.6 cm in order to make good grasping by the consumer possible. The other side may have size of 11.6-15.0 cm and more preferably 12.4-13.5 cm. The maximum height of the packaging including the lid is 22 cm and preferably approximately 10 - 20 cm and more preferably 15-20 cm.

The invention also relates to a method for providing a pack filled with powder, comprising the provision of a container provided with a base, the inside wall of the container consisting of a heat-sealable material, filling powder into said container, placing a heat-sealable film above the powder and joining said film to said container wall, provision being made for the fitting of a lid.

More particularly, the containers are produced from blanks at the packing location, so that only small volumes of packaging material have to be fed to the packaging installation. More particularly, the container is first produced and this is then filled and provided with the seal described above and only then is the lid, including lid rim, fitted. The introduction of gas before/during application of the seal can be carried out either on a continuous basis or batchwise.

It has been indicated above that the container is preferably of rectangular cross-section. More particularly, this rectangular shape bulges outwards to some extent in the middle of at least two opposing sides. Such bulging can be limited and is preferably less than approximately 7 mm and more preferably less than 2 mm on the short side and less than approximately 16 mm on the long side. However, acute angles should preferably be avoided. That is to say, with respect to the straight line connecting the points of greatest deflection/inflexion, the outward deviation is less than approximately 7 mm and approximately 16 mm, respectively, and preferably 3 - 6 and 7 - 15 mm, respectively. Moreover, the container can be provided with finger holds to facilitate handling.

As a result of the specific choice of the abovementioned dimensions, the base surface area of the container is 120 - 150 cm<sup>2</sup>, in particular 125 - 140 cm<sup>2</sup>, for example 126 - 136 cm<sup>2</sup>.

The invention is in particular provided with a closure indicating tamper (tamper evidence). This is implemented in that the lid rim is provided with a peripheral part that extends upwards and that extends to the top of the lid periphery or beyond this. As a result it is not easily possible to raise the lid located within it. The circumferential rim of the lid is not accessible in the closed position. The peripheral edge accommodating the circumferential rim can be interrupted to obtain access to for example a lip extending from the lid. Such means for interrupting the peripheral edge can comprise a break away portion thereof. This is effected, for example, by fixing the break away part at two points on each side of edge. By breaking away the part the lip of the lid is exposed and the lid can be opened. When the part is broken away the abovementioned joins to the lid rim (peripheral edge) are destroyed, so that it is clear that tampering has taken place through the interruption of the circumference line. Thereafter the lid can always easily be opened after closing.

The invention will be explained in more detail below with reference to an illustrative embodiment shown in the drawing. In the drawing:

Fig. 1 shows, diagrammatically, a perspective and partially exposed view of the container according to the invention;

Fig. 1a is a detail of fig. 1 with the lid in closed condition;

Fig. 2 shows a plan view of the seal according to the invention;

5 Fig. 3 shows the section along the line III-III in Fig. 1;

Fig. 4 shows the section along the line IV-IV of the lid and the container in closed position;

Fig. 5 shows in perspective view a further embodiment of the lid according to the invention;

10 Fig. 6 shows in top view the lid of Fig. 5; and

Fig. 7 shows, diagrammatically, an installation for the production of packs according to the invention.

In Fig. 1 a packaging according to the invention is indicated by 1. This consists of a container 2 with base 17. The base 17 is positioned inside the container so that it is somewhat raised, so that an upright rim 29 is produced. This upright rim facilitates stacking of further containers.

3 indicates a lid with lip 18 that is joined via a hinge 5 to a lid rim 4. Lid and lid rim consist of a plastic material and are produced by injection moulding. As can be seen from Fig. 4, in the closed position the top of lid 3 close to the periphery thereof is somewhat below the top of the raised peripheral edge 23 of the lid rim. The lid 3 is provided with a depending edge 26 fitting relatively closely inside the circumferential edge 27 on the lid rim 4. The circumferential upper part of lid 3 is referred to by 28 and fits closely adjacent to peripheral edge 23. As a result it is not possible to grasp the lid except at the location of the cut-out 24 in the peripheral edge 23. In the closed position the depending part of lip 18 extends in front of cut-out 24. Access to lip 18 is prevented by part 25 being in front of lip 18. This is shown in more detail in fig. 1a. It is clear that lip 18 has a barbed protrusion engaging below a projection of part 25 and preventing lifting of lip 18 as long as part 25 is present. On delivery, the cut-out 24 is closed off by part 25, which is joined to the peripheral edge 23 on either side by two points 48 in each case. Connection of part 25 to the circumferential edge 23 can be realised in any other way such as by local decrease in thickness. Part 25 can be broken away easily and after breaking away the lid can be opened by lifting lip 18. In this way it is clear to the user that he or she is the first person to open the pack.

If part 25 has been tampered with this will be immediately evident because it is at the outer circumference of the container. It must be understood that the evidence of first opener described above (tamper-proof evidence) can also be used in combination with packagings other than are described here and rights are explicitly requested for this. The lid rim is clamped or bonded to the container wall, or fixed in some other way known in the state of the art. The outer periphery of the lid/lid rim is such that this falls within the periphery of upright lower rim 29. The container is of essentially rectangular construction, but it can clearly be seen from the drawing that there is slight bulging in the middle of the flat walls. This is indicated diagrammatically by b for the front face. Such bulging can be limited and is preferably less than approximately 7 mm on the short side and less than approximately 16 mm on the long side. That is to say, with respect to the straight line that joins the points of greatest deflection/inflexion, the outward deviation is less than approximately 7 mm and approximately 16 mm, respectively, and preferably 3 - 6 and 7 - 15 mm, respectively. Furthermore, the container can be provided with finger holds to facilitate handling thereof.

As can be seen from Fig. 1, the lid rim 4 is provided with a levelling-off strip 6. When the pack is held at an angle, the overfilled scoop can then be moved under edge 6 and an accurate volume is thus determined. Moreover, as a result of the construction of the edge, no compression of the powder or product takes place, so that there is always a reproducible amount of material in the scoop.

Product 11, such as baby food, is contained in the container 2. A seal 13, consisting of a film material that has been applied to the inside of the wall of the container 2 by heat sealing, has been arranged immediately above this product. This film material is provided with a weakening line 14 and a pull lip 15. When pull lip 15 is grasped, film 13 will tear along weakening line 14 and access to the product thus becomes possible.

Lid 3 is provided with a convex portion 9 that falls within the elevation produced by the upright rim 28 of a further pack optionally stacked on top of the pack shown here. Moreover, there is a further elevation 10 in which part of scoop 8 is accommodated. This part is preferably the bowl of the scoop. Optionally there can be yet a further elevation for the (end of) the handle.

The size of the scoop is dependent on the desired dosage. The elevation 10 can extend above the elevation 9, as can be seen from the cross-section according to Fig. 3. The maximum of the elevation 10 with respect to the base is indicated by "a" and is between 4 and 12 mm. Because the container is provided with a peripheral rim 28 at the bottom, these



elevations fall within the space delimited by said rim 18 and base 17. For accurate centring, rim 18 is flanged inwards to some extent from the base 17, so that a clearly fixed position is obtained when stacking. The height of the base with respect to the positioning surface of the container is matched to the height of the elevation with respect to the position where the side walls of the container bear on the underlying pack. This is shown by "b" in Figure 4. The handle of scoop 8 can be clamped with a snap fit between lips 7 that are integral with the lid and are preferably located close to or in the middle of the lid. The container wall is provided with recesses 16 that correspond to the shape of the user's fingers. Clamping the scoop to the lid avoids the scoop being dropped back into the powder after first use. If the scoop is clicked into the lid, bacterial contamination can be prevented as far as possible. Before the first opening of the container, i.e. after shipment from the filling facility the scoop 8 might be loosely arranged on seal 13. This is shown in Fig. 4. It can be concluded from Fig. 4 that the size of scoop 8 is such that the accommodation defined by the top of the lid and the lower side thereof is not sufficient to receive the scoop. Because of that seal 13 is provided at a distance  $r$  from the lowest point of the accommodation in the lid for spoon of the container. This distance  $r$  is preferably between 20 and 50 mm and more in particular about 40 mm. In this way the height of the lid can be kept relatively low which allows for easy stacking during production thereof.

Preferably, the height of the lid is such that also after first use, when the seal is removed and scoop 8 is clamped between lips 7, the scoop extends partially in the space below the lid and defined by the top of the container 2.

The edge 23 is made upright in order to make it possible that powder that is spilt during movement of the filled scoop falls back into the container.

It can be seen from Fig. 3 that the wall of the container is made up of a laminate. From outside to inside this consists of a layer of board/paper 20, a relatively thin aluminium foil 21 and, arranged inside this, a layer of a plastic material 22 that can be joined to seal 13 by heat sealing. As a result of the use of the seal, the risk that foreign bodies could reach the product is limited. After all, after the seal has been applied such undesired bodies, such as plastic parts of the scoop, will remain on top of the seal and not be able to reach the powder.

A few typical dimensions of the packaging will be given below. However, it must be understood that these must be interpreted as non-limiting if baby food is packed.

The distance between the bottom of the lid and the top of the seal is preferably between 14 and 27 mm. More particularly this distance is between 7 and 23 mm. Such a gap is precisely enough to accommodate a scoop. However, this height will vary depending on the desired volume of the scoop.

5       The gap below the seal and above the powder is preferably less than 10 mm and more particularly less than 5 mm. That is to say the seal is positioned as close as possible to the powder during packing.

10       As can be seen from the drawing, the container is of rectangular construction, as a result of which this can be emptied to the optimum with the aid of scoop 8. In order to optimise emptying, the length of the scoop is preferably 60 - 95 % of the diagonal of the container and more particularly 70 - 90 % thereof.

As a result of the use of rectangular containers, optimum use can be made of the available volume either in the packaging or on the shelf of the retail organisation.

15       In Fig. 5 a further embodiment of the lid according to the invention is shown. This is generally referred to by 53 and basically correspond with lid 3 according to the previous figures. The elevation for the scoop is referred to by 60, 61. Elevation 60 is adapted to receive part of the bowl 52 of scoop 58 whilst elevation 61 is provided to receive stem 54 thereof. In between both elevation 60, 61 reinforcement ribs of the lid extend. Clamping means 57 are shown in dotted lines. This embodiment arrangement is such that in clamped position the open side of bowl 52 is directed to accommodation 60. This means that it is possible to receive bowls having different "height" between clamping lips 57. This allows for the use of several sized bowls of scoop 58 without adaptation to the design of the lid. Also, in this embodiment only part of the scoop is accommodated by the lid whilst the remaining part is accommodated by the space above the seal in the container.

20       An installation for the production of a pack is shown in Fig. 6. This consists of a feed station 31, into which blanks 32 are introduced. With the aid of a folding/sealing station 33 the containers 34 according to the present invention are produced therefrom. These containers consist of a wall and a base without lid. The product is then introduced at 35. At 30 the sealing film is applied by heat sealing while introducing an inert gas into the space in which the product is stored. In this way a volume that remains gastight is obtained in which the product can be stored for a very long period without damage. The introduction of gas can be carried out either batchwise or continuously in station 30. Checks on the packaging and the contents are carried out at 39. The lid, together with the lid rim, is then

pressed onto the container wall and fixed thereto at 37. Collection and packing takes place at 38.

Although the invention has been described above with reference to a preferred embodiment, it must be understood that numerous modifications can be made thereto without going beyond the scope of the present application as defined in the appended claims.